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Fish Stocking Assessment of Dina Lake # 7, 2001

R. J. Zemlak and D. M. Cowie
January 2004

PWFWCP Report No. 281

105-02338/

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

Citation: R.J. Zemlak and D.M. Cowie. 2004. Fish stocking assessment of Dina Lake # 7, 2001. Peace/Williston Fish and Wildlife Compensation Program Report No. 281. 14pp plus appendices.

Author(s): Randy J. Zemlak[1] and Dawn M. Cowie[1]
Address(es): [1] Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave., 3rd Floor, Prince George, B.C. V2L 3H9

DINA LAKE #7

WATERSHED:	Parsnip River
DATE OF SURVEY:	September 18 and 19, 2001
FIELD CREW LEADER:	Randy J. Zemlak
FIELD ASSISSTANT:	Arne R. Langston

PEACE/WILLISTON FISH AND WILDLIFE COMPENSATION PROGRAM

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GENERATION

and

MINISTRY OF WATER, LAND and AIR PROTECTION

ENVIRONMENTAL STEWARDHIP DIVISION

REPORT PREPARED BY: RANDY J. ZEMLAK
DAWN M. COWIE

Lake: **Dina #7**

INTRODUCTION

Dina Lake #7, located near Mackenzie BC, is a small lake adjacent to Dina Lake #3 of the chain of Dina Lakes (Figure 1). In June 1991, a standard fisheries baseline reconnaissance level survey of Dina Lake #7 was conducted by the Peace/Williston Fish and Wildlife Compensation Program (PWFWCP) (McLean 1991). No game fish were identified in the lake and it was deemed suitable for future fish introductions. BC Environment then developed a Fisheries Management Plan in February 1992 for the Dina Lakes chain (Jesson 1992). Shortly after this time, rainbow trout were stocked in Dina Lake #7. All of the above reports can be viewed at the PWFWCP office (address on cover page).

During September 2001, PWFWCP fish biologists investigated Dina Lake #7 primarily to evaluate the success of the current fish stocking program and to determine if changes to the stocking program were required.

LAKE LOCATION

Location:	25 km north/northwest of Mackenzie BC
Elevation:	± 686 m
Latitude/Longitude:	55° 31' 13" : 123° 17' 23"
U.T.M.:	10.0481708.6152728 (NAD 1983)
Management Unit:	7-30
N.T.S. Map No.:	93 - O/11
Waterbody Identifier:	00357PARA
Lake Drainage:	closed system

ACCESS

Although access to Dina Lake #7 has not changed significantly since the original reconnaissance level lake inventory (1991), exact road directions and conditions may have changed over time. From the Alexander Mackenzie Hotel in Mackenzie (0.0 km), drive north on the Mackenzie Boulevard/Finlay Forks Forest Service Road. At 0.4 km, drive straight through the 4 way intersection. At 7.5 km, the road changes from a two lane paved road to a two lane gravel (2wd) road. At 8.4 km, cross Morfee Creek bridge. At 9.5 km, there is a four way intersection. Stay straight on the Parsnip West Forest Service Road. At 10.0 km, cross the Mugaha Creek bridge. At 10.4 km, stay right at this three way intersection. At 15.8 km, cross Tutu Creek bridge. At 19.7 km, go straight, do not go right on the Tony Creek M.L. road. At 20.4 km, cross Tony Creek bridge. At 21.8 km, go past Heather Lake. At 28.3 km, turn left onto Dina Lake #3 parking area, a single lane, gravel road, 2wd. The road is deactivated and can only be accessed by foot. It is approximately a 20 minute walk to Dina Lake #3. Once at Dina #3, walk south along the lake edge for 400 m. Dina #7 is located just over a small hill. Both lakes are about 100 m apart.

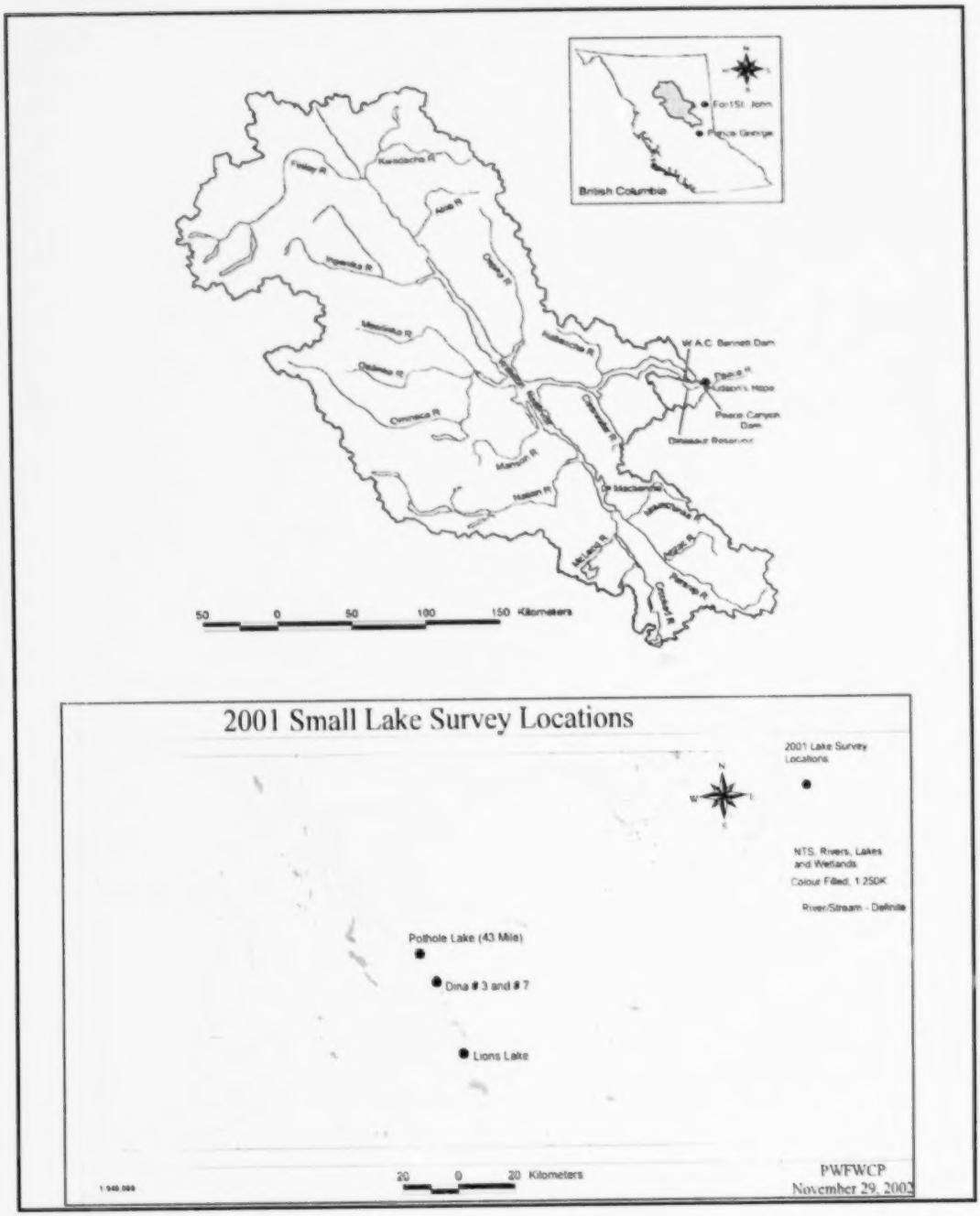

Figure 1. Location of Dina Lake #7.

STOCKING HISTORY

Rainbow Trout

Dina Lake #7 was initially stocked with 3,000 rainbow trout in 1992 (Table 1). The stocking program for this lake has been relatively consistent (stocked annually initially, then continued with bi-annual stocking). Currently, the lake receives 1,500 fish every 2 years. The size of these fish are yearlings.

Table 1. Dina Lake #7 rainbow trout stocking history.

Year	Number	Size (g)	Life Stage	Stock
1992	3,000	0.9	fry	Pennask HATH
1993	1,500	20.0	yearling	Pennask AF
1994	1,500	25.6	yearling	Pennask AF
1996	1,500	17.2	yearling	Pennask HATH
1998	1,500	12.7	yearling	Pennask AF
2000	1,500	4.8	yearling	Pennask P AF

A total of 10,500 rainbow trout have been stocked over the last nine years. The average size of these fish has been about 13.5 g.

METHODS

Three different techniques were used to determine relative abundance of fish species in Dina Lake #7. Conversations with the Ministry of Water, Land and Air Protection (MWLAP) fish biologists, prior to the fish sampling effort, suggested that it would be valuable to have at least 10 fish sampled from each age group to accurately provide future recommendations to the stocking program. Therefore, it may have been deemed necessary to keep the nets in the water overnight. Two sinking monofilament experimental gill nets were set overnight. Net one consisted of six different sized mesh panels ranging from 25 to 85 mm. Each panel is 15.24 m long and 2.4 m wide. The second net was a single panel gill net, 19 mm stretch mesh. The intent of using this small panel was to look for small sized fish species that could have been missed in the original inventory.

The second method used was Gee traps. Each Gee trap (two in total) was baited with sardines and set overnight. The Gee traps were set in shallow (< 2 m) littoral habitat. The third technique used to capture fish was angling gear. A spin cast rod with an assortment of lures and a fly rod with dry flies were utilised. Angling efforts by PWFWCP fish biologists were also recorded to determine additional catch per unit effort (CPUE).

The rainbow trout captured were measured for fork length (mm) and weight (g). A biological examination of the fish was conducted which revealed sex, maturity, stomach contents, and disease/parasite presence. Scale samples were collected for age determination and analysis was performed by North/South Consultants (NSC). General

appearance of the fish was determined through visual analysis. Photographs of fish were taken but are not included in this report. Mean lengths and weights were determined for each age class of rainbow trout. Condition factors ($Weight(g)/Length(cm)^3 \times 100$) were determined for each individual fish and for each age class.

The habitat features of Dina Lake #7 were briefly assessed. The entire perimeter of the lake was observed to confirm the lack of any inlets or outlet stream. The benchmark set during the original study (1991) no longer exists. The spruce tree to which it was affixed had fallen into the lake. A new benchmark was then established on the eastern shore. Changes to the current water level was measured with an Abney level, 1.5 m staff, and a 30 m Eslon tape. Photo documentation was taken of the lake habitat but is not presented in this report.

A limnology station was established to profile the water temperature and dissolved oxygen at varying depths. A YSI model 58 oxygen/temperature meter was used for the limnological profile. Oxygen and water temperature were recorded at the surface to the bottom at 1.0 meter intervals. Time and weather conditions were also recorded.

RESULTS

Of the three methods used to estimate fish populations in Dina Lake #7, gill nets and angling gear were the methods that produced fish (Table 2). Most fish (30 of 37) were captured by the experimental gill net while angling captured the remaining 7 fish.

Table 2. Lake catch summary for Dina Lake #7, 2001.

Date	Species	Net Set Number				Gee Traps		Angled	Total	Number Sampled	Size Range (cm)
		1	2	3	4	1	2				
Sept 18	RB	19	-	-	-	-	-	-	19	19	24.3-33.2
Sept 18	none	-	0	-	-	-	-	-	-	-	-
Sept 18	none	-	-	0	-	-	-	-	-	-	-
Sept 18	none	-	-	-	-	0	-	-	-	-	-
Sept 18	none	-	-	-	-	-	0	-	-	-	-
Sept 18	RB	-	-	-	-	-	-	3	3	3	24.7-28.8
Sept 19	RB	-	-	-	11	-	-	-	11	11	22.6-33.1
Sept 19	RB	-	-	-	-	-	-	4	4	4	24.7-31.2

Gill Nets

Four gill net sets were utilized over a 2 day time frame (Figure 2). Set #1 (six panel net) was set for 4.25 hours and produced 19 rainbow trout. Set #2 (one panel net) was set for 50 minutes, then relocated to a shallower depth (set #3) due to anoxic conditions. Set #3 (one panel net) was then set overnight for 24.15 hours and yielded no fish.

Lake: **Dina #7**

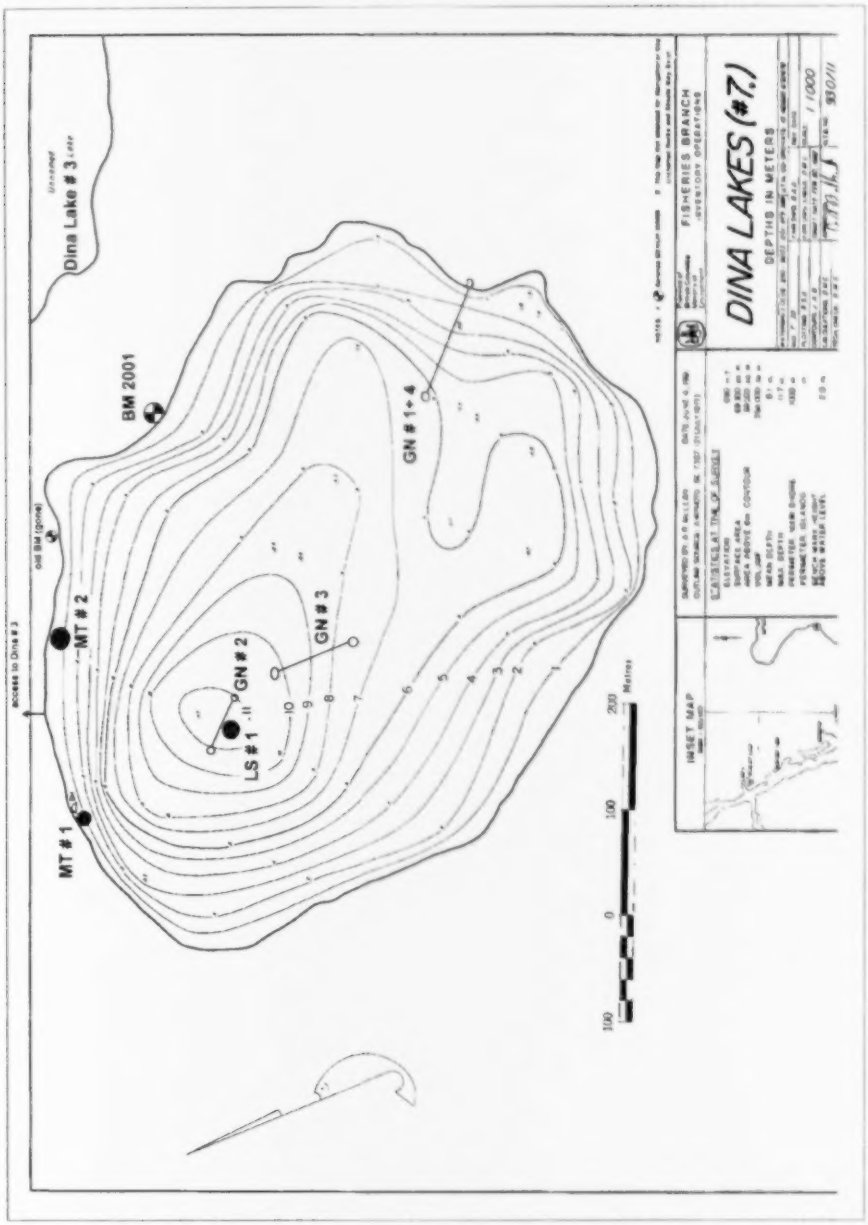

Figure 2. Location of gill net sets, Gee traps, and limnology station on Dina Lake #7.

Set #4 (six panel net) was set for 3.47 hours and produced 11 rainbow trout. The nets were checked periodically throughout the day to avoid capturing too many fish (Appendix 1).

Mean lengths and weights were calculated by age for all fish (Table 3). The range in lengths was slightly larger for age 2 fish as opposed to the age 4 fish. The length-weight relationship was also graphed (Figure 3).

Table 3. Population characteristics of rainbow trout in Dina Lake #7, 2001.

Age Class	Sample No.	Mean Length (cm)	Range of Length (cm)	SD for Length	Mean Weight (g)	Range of Weight (g)	SD for Weight
2	16	25.7	22.6 - 27.4	1.29	175.0	127.0 - 232.0	25.5
4	20	31.4	30.0 - 33.2	0.93	317.7	222.0 - 398.0	49.5

Note: one fish (28.8 cm FL) could not be aged

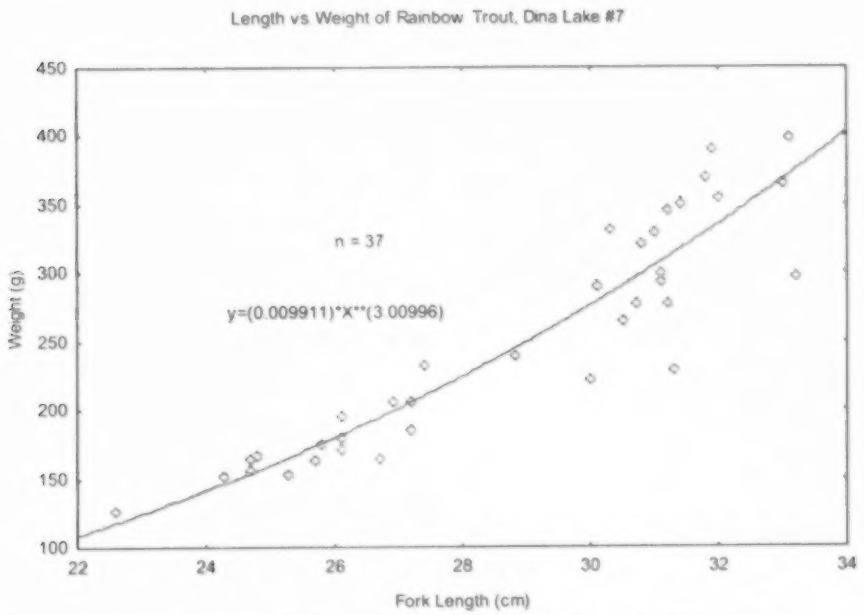

Figure 3. Length versus weight of rainbow trout in Dina Lake #7, 2001.

The overall growth of these fish in Dina #7 appear to be isometric (where the fish's shape does not change as it its grows). The age 2 fish (22.6 – 27.4 cm FL) display a fairly consistent length-weight relationship while the age 4 fish (30.0 – 33.2 cm FL) have a wider range of weights for a given length. Some of this variation may be based on the ageing of these fish.

Ageing of fish in Dina #7 proved to be inconsistent among readers. Age determination for all of the rainbow trout was originally determined by NSC (Appendix 2). Prints of the scales and age markings were produced and provided for each fish, and later reviewed by Program biologists. It was eventually determined that 22 of the ages were deemed incorrect by Program biologists. Since the lake has been stocked bi-annually with only female fish and the lake affords no spawning habitat (i.e. no recruitment), only even age fish should be observed in the sample of fish collected. The age results provided by NSC indicated that there were also age 3 and 5 fish. These odd ages were very unlikely; therefore, the scale prints were shipped back and reviewed again by NSC a second time. Program biologists then reviewed NSC's second age data, and from this, determined the final ages for these 22 fish that were in discrepancy (Table 4). These final results were based on the knowledge of the lake, stocking history, and lack of any recruitment in Dina #7.

Table 4. Age discrepancy for 22 rainbow trout in Dina Lake #7, 2001.

Fish Number	NSC Initial Age	P/W Biologist Initial Age	NSC Second Age	P/W Biologist Final Age
1	3	2	4	2
5	3	2	4	2
10	3	4	4	4
11	3	4	4	4
12	3	4	4	4
13	3	4	4	4
14	3	2	3	2
15	3	2	3-4	2
16	3	2	3	2
18	3	4	4	4
20	3	4	4	4
21	3	4	4	4
22	5	4	5	4
23	3	2	4	2
26	3	4	4	4
27	3	2	3	2
28	3	4	4	4
30	3	4	3	4
32	5	4	5	4
34	3	4	4	4
35	3	4	4	4
36	3	4	4	4

The second reading of the scales by NSC was conducted by a different technician so as not to bias the results. His readings confirmed that 12 of the fish agreed with PWFWCP revised ages, 7 confirm the initial NSC ages, and 3 of his ages were higher than the PWFWCP revised ages. According to Paul Graveline (NSC), scales do not always provide an accurate estimate of age for some species. Scales from fish older than the age of maturity may under-estimate age. In addition, under certain naturally occurring

environmental conditions, salmonids do not form annuli on their scales until the conclusion of their second growing season (Lentsch and Griffith 1987). Nonetheless, the interpretation of the fish scales in Dina #7 proved to be difficult.

Program biologists finally determined that there were only two age groups present (2 and 4 year old fish). No age 6 or older fish were observed. The majority of rainbow trout captured were age class 4 fish (21 of 37). One fish's scales were unreadable (fish number 3). The remaining 16 fish were determined to be 2 year olds (Figure 4). Since the Dina #7 data presented a lot of discrepancy in ages, a length-frequency graph was then created to validate the final ages (Figure 5). Examination of this graph does show two possible age classes.

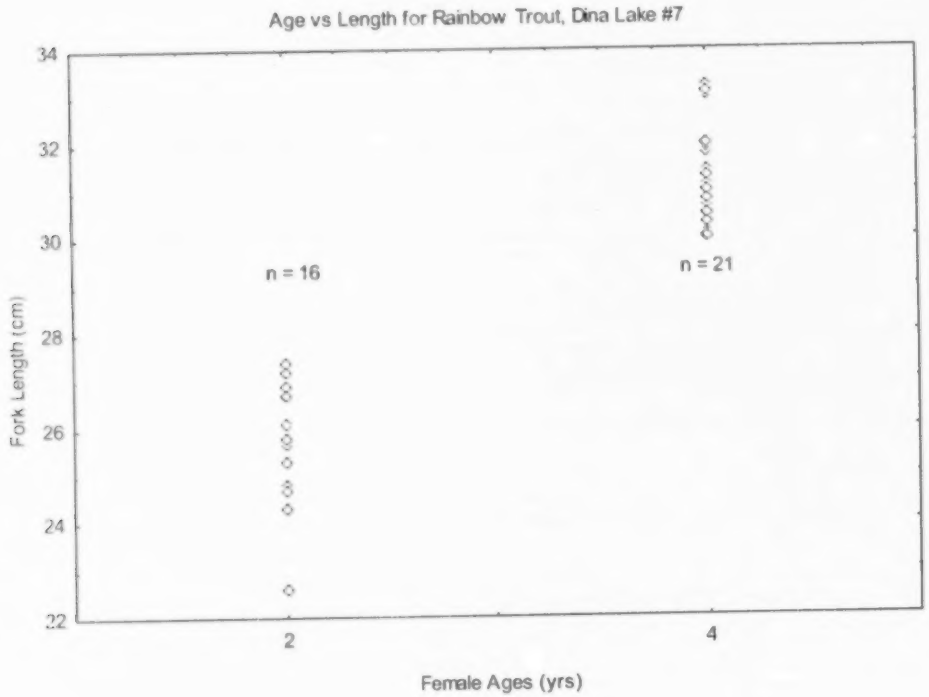

Figure 4. Age versus length of rainbow trout in Dina Lake #7, 2001.

All 37 rainbow trout were females (which were originally stocked). From the field observations, there were three maturity levels observed in these captured fish: 14 immature, 4 maturing, and 18 were spawnbound (full of ripe eggs). Without any suitable spawning habitat (and lack of males), these mature fish have no choice but to reabsorb their eggs throughout the summer. It was difficult to decipher if these three maturity levels represented three different ages.

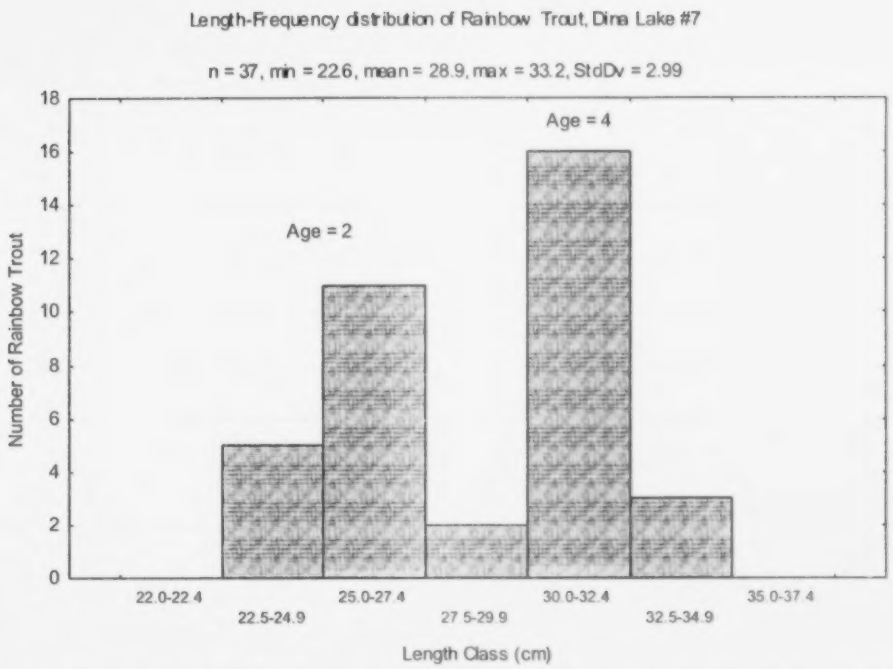

Figure 5. Length-frequency distribution of rainbow trout in Dina Lake #7, 2001.

The bin size for the length-frequency graph were chosen randomly (2.5 cm). With the range in lengths of the fish being quite narrow (10.6 cm), the bin size had to be quite small in order to observe any differences in length classes. The first peak (26.0 cm) represents the age 2 fish while the second peak (31.0 cm) represents the age 4 fish.

Condition factors were determined for the entire sample (Table 5). The average condition was 1.03 indicating healthy fish for all 37 fish sampled for length. These values were then plotted versus fork length and age (Figure 6). There was a wide range in conditions (0.75 to 1.2) for the range in lengths and age. Most of the range in conditions occurred as the fish got older (age 4). The mean condition factors were also slightly above 1.0 for the age 2 and 4 fish. No signs of stunting are evident in the Dina #7 population.

Table 5. Condition factors for rainbow trout captured in Dina Lake #7 in 2001.

Condition Factor	2001 Survey Results
Number of fish	37
Mean C.F.	1.03
Minimum C.F.	0.75
Maximum C.F.	1.20
Standard Deviation	0.11

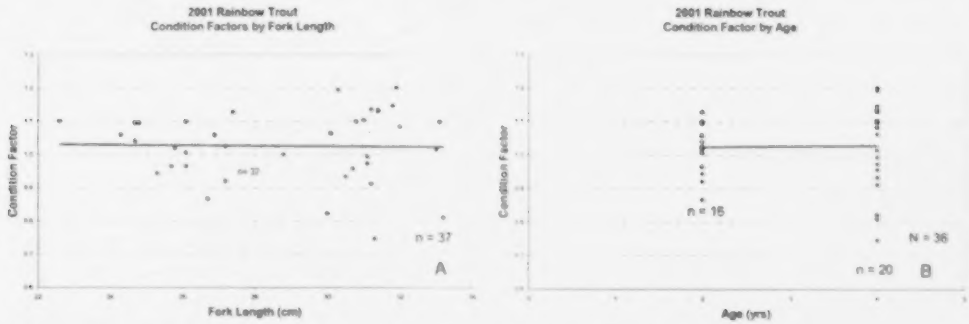

Figure 6. Condition factors of rainbow trout in Dina Lake # 7, 2001.

Gee Traps

Two Gee traps were used to capture juvenile fish. The traps were set overnight (Figure 2) for a minimum of 23.2 hours (Table 6). No fish were caught in either Gee trap. Only one leech was observed.

Table 6. Gee trap results.

Trap No.	Hours Fished	Depth (m)	Substrate	Species	Number	Size Range (mm)
1	23.27	0.8	organics/SWD[1]/ *Nuphar*	none	0	-
2	23.24	0.9	organics over cobble	leech	1	-

[1]SWD = small woody debris

Angling

On September 18 and 19, Program biologists angled for 1.5 hours and 0.5 hours respectively, using a total of two rods. September 18 yielded three rainbow trout and September 19 yielded four rainbow trout. The combined catch per unit effort was 1.75 fish per rod hour. Numerous other quick strikes were noted but there was difficulty in setting the hook. Few fish were observed rising at the surface. All fish caught were approximately 454 g in size.

Limnology

A limnology station was established at the deepest part of the lake (Figure 2). The limnology profile was completed on September 18, 2001 at 1100 hours. Weather conditions were sunny with 60% overcast and a slight breeze. Water temperature and dissolved oxygen measurements were taken at 1.0 m intervals (Table 7). Oxygen levels for rainbow trout were adequate to the 9.0 m depth. At 10.0 m, the oxygen levels were much lower than the upper water column.

Table 7. Limnology Profile for Dina Lake #7, September 18, 2001.

Depth (m)	Dissolved Oxygen (O_2)	Temperature (degrees Celsius)
Surface	8.0	14.9
1.0	8.0	14.9
2.0	8.0	14.9
3.0	7.8	14.8
4.0	7.5	14.7
5.0	7.5	14.6
6.0	7.2	14.5
7.0	7.0	14.5
8.0	6.8	14.4
9.0	6.3	14.2
10.0	1.8	13.1
11.0	0.6	10.8
12.0	bottom	bottom

BIOLOGICAL ANALYSIS OF RAINBOW TROUT

A biological analysis was conducted on 37 rainbow trout (Appendix 2). All fish caught were females. Reproductive organ analysis revealed that 18 of the fish were mature, 14 were immature, and 4 were maturing. Eight of the spawnbound females were empty of eggs, while three were full of eggs. It appears a spawnbound problem exists in Dina #7. Most of the spawnbound females were also developing their second set of eggs.

Examination of stomach contents suggest that rainbow trout are preying primarily on zooplankton. Other common foods included: *Trichoptera* and *Gammarus* species. External examination indicated healthy fish with the exception of one fish that had black spot disease. Internal examination revealed tapeworms in two fish.

DRAINAGE

Dina Lake #7 is a closed system (no inlets or outlet). The entire shoreline perimeter of this lake was observed. The lack of any inlets or an outlet was confirmed. No significant changes to the lake level (high water mark) were noted. The distance between Dina Lake #7 and #3 is 100 m and no streams connecting the two lakes were observed.

BENCHMARK

The original benchmark set in 1991, located on the northeast shore, no longer exists as the tree has fallen into the lake. Program biologists established a new benchmark during the 2001 survey (Figure 2). The new benchmark (not painted orange) was established on the eastern shore at 2.0 m above the current water line in a white spruce tree having a diameter

of 35 cm. The tree is located 1.77 m from the current water level (UTM 10.0481936.6152632).

FISHERIES MANAGEMENT COMMENTS

Rainbow Trout

Dina Lake #7 supports a population of stocked rainbow trout. No overnight net sets were warranted as the sample size of fish were obtained throughout a two day time period. The experimental net's CPUE on September 18 was 4.47 rainbow trout per net-hour while on September 19, the CPUE was 3.17 rainbow trout per net-hour. Angling efforts were also adequate (no signs of stunted fish). These fish are expressing a healthy condition factor. Therefore, the number of fish currently being stocked in Dina #7 appears to be sufficient.

Although, the current stock of all female fish are expressing spawnbound problems. These fish are not providing a very good summer sport fishery. Dina #7 does not afford any suitable spawning habitat for these fish to spawn. Therefore, an alternate stock of fish should be considered for this lake.

Non-game fish

Dina Lake #7 does not support any populations of non-game fish.

MISCELLANEOUS COMMENTS

1. A fisheries management plan encompassing all ten of the Dina Lakes chain was produced by Duane A. Jesson, BC Environment Fisheries Branch, Prince George, BC in February 1992.

2. Photographs of Dina Lake #7 were taken of some fish species and the surrounding habitat. Most photos were taken to document the change in features over time (i.e. habitat) and are not significant to the relevance of this report on fish stocking. Therefore, these photos are not displayed in this fish stock assessment report but can be viewed at the address indicated at the beginning of this report.

FISH STOCKING PROGRAM

Rainbow Trout

From the fish captured in the 2001 survey, there appears to be no evidence of stunting. The condition factor for the 2001 fish was 1.03 (n = 37). These results indicate there is no problem with overpopulation as these fish are able to grow larger. Based on these results, the stocking rate of 1,500 fish should not be altered and appears adequate at this time. A

consideration of switching from all females to a sterile stock of triploids should be considered for future stocking in Dina #7.

The all female stock of fish are currently exhibiting a spawnbound problem. These fish do not provide for a great recreational fishing experience. These fish, at times, can be lethargic and are obviously not a good table fish (for food consumption). Therefore, with the newly available sterile stocks, Dina #7 appears to be a suitable candidate for these triploid fish. By switching to a sterile stock, this will alleviate the spawnbound problem and thus provide for a better recreational opportunity for anglers.

With this change in strain of fish stocked into Dina Lake #7, the lake should then be re-assessed in a 4 year time frame. Therefore, the next scheduled assessment for Dina #7 should take place in the summer of 2005. At that time, there would be two age classes to assess.

OTHER RECOMMENDATIONS

While local anglers are targeting Dina #7, the amount of angling use on this lake is unknown. A winter fishery exists on this lake as well. Understanding the CPUE would also assist with future recommendations to the stocking program. An accurate count of anglers on Dina Lake #7 is impossible to know with any certainty and a future creel survey may help determine this answer. While on the ground creels can be expensive, one possible solution could be to undertake an aerial boat count survey. This survey was developed by the MWLAP under the Small Lakes Index Management (SLIM) program. Dina #7 would be suitable for this type of angler use survey.

Another more economical way to determine the CPUE would be to conduct a limited creel survey during high use periods (i.e. long weekends). This survey may be a more cost effective means to obtain CPUE data without having to conduct a full creel survey. Future data collection and anecdotal information received will provide a better idea of the angler use/CPUE and would assist with the future stocking recommendations for Dina Lake #7.

LITERATURE CITED

Lentsch, L.D. and J.S. Griffith. 1987. Lack of first-year annuli on scales: Frequency of occurrence and predictability in trout of the western United States. The Iowa State University Press, Ames, Iowa 50010. Pages 177–188.

McLean, A.R. 1991. A reconnaissance survey of Dina Lake #7. Peace/Williston Fish and Wildlife Compensation Program, Prince George, B.C., Report No.105. 21pp plus appendices.

Jesson, Duane A. 1992. Fisheries management plan for the Dina Lakes. B.C. Environment, Fisheries Branch, Prince George, B.C. 18pp plus appendices.

APPENDIX 1

Netting Record

Lake: **Dina #7**

NETTING RECORD **September 18, 2001**

Mesh sizes experimental order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE #1

Type:	Sinking monofilament gill net		
Date Set:	September 18, 2001	Time:	1045hrs
Date Lifted:	September 18, 2001	Time:	1500 hrs
Net Dimensions:	Length: 91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth: Substrate:	1.2 m organics, SWD, *Nuphar*
Deep End Mesh Size:	64 mm	Depth: Substrate:	6.5 m unknown

Comments:

Net was checked at 1250 hrs on September 18. Looked at the first five panels and it had 10 RB in it; therefore, it was left in to fish until 1500 hours. Gill net #1 produced 19 RB.

Mesh sizes: 19 mm, 1 panel

NETTING SITE #2

Type:	Sinking monofilament gill net		
Date Set:	September 18, 2001	Time:	1055 hrs
Date Lifted:	September 18, 2001	Time:	1145 hrs
Net Dimensions:	Length: 15.24 m	Depth:	2.4 m
Shallow End Mesh Size:	19 mm	Depth: Substrate:	11.0 m unknown
Deep End Mesh Size:	19 mm	Depth: Substrate:	11.0 m unknown

Comments:

Net was pulled due to anoxic conditions on the bottom. No fish were caught. Then moved net to shallower water.

Lake: **Dina #7**

NETTING RECORD **September 18 & 19, 2001**

Mesh sizes: 19 mm, 1 panel

NETTING SITE # 3

Type:	Sinking monofilament gill net		
Date Set:	September 18, 2001	Time:	1150 hrs
Date Lifted:	September 19, 2001	Time:	1025 hrs
Net Dimensions:	Length: 15.24 m	Depth:	2.4 m
Shallow End Mesh Size:	19 mm	Depth: Substrate:	8.5 m unknown
Deep End Mesh Size:	19 mm	Depth: Substrate:	10.1 m unknown

Comments:

Net checked at 1510 hours; no fish caught. Left to fish overnight. No fish captured.

Mesh sizes experimental order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE # 4

Type:	Sinking monofilament gill net		
Date Set:	September 19, 2001	Time:	0918 hrs
Date Lifted:	September 19, 2001	Time:	1305 hrs
Net Dimensions:	Length: 91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth: Substrate:	1.2 m organics, SWD, *Nuphar*
Deep End Mesh Size:	64 mm	Depth: Substrate:	6.5 m unknown

Comments:

Net was reset in the same location as September 18th net set #1. Net pulled after roughly 5 hours of fishing. Set caught 11 RB. End of netting survey.

APPENDIX 2

Individual Fish Data

Lake: **Dina #7**

INDIVIDUAL FISH DATA

Date Captured: September 18, 2001
Gill Net # 1 + Angling

M - Male, F - Female, ? - Not Obvious

IMM - Immature, MG - Maturing, MT - Mature, GV - Gravid, SP - Spent, ? - Not Obvious

EG - Egg, ML - Milt, HD - Head, TG - Fish Tag, ST - Stomach

SC - Scale, FR - Fin Ray, OT - Otolith, WF - Whole Fish

Method of Capture: Sinking monofilament gill net.
Condition Factor (K) = $W / L^3 \times 100$

Species	Fork Length (cm)	Weight (grams)	Condition Factor	Gonadal Maturity	Sex	Type	Age (yrs)	Stomach Contents				Comments
								Plankton	Insects	Fish	Other	
RB	27.2	185.4	0.92	IMM	F	SC	2	Full zooplankton				angled
RB	24.7	156.8	1.04	IMM	F	SC	2	Full zooplankton				angled
RB	28.8	238.9	1.00	Full of eggs	F	Sc	?					angled
RB	27.2	206.3	1.03	IMM	F	SC	2			clams/ shrimp	Snail	Spawnbound; full
RB	26.1	171.7	0.97	IMM	F	SC	2	zooplankton	bloodworms	clams/ shrimp	Snail	
RB	26.1	195.4	1.10	MG	F	SC	2	zooplankton	worms	clams/ shrimp	Snail	
RB	24.8	167.1	1.10	IMM	F	SC	2	zooplankton		shrimp	Snail	
RB	25.7	163.8	0.96	IMM	F	SC	2	zooplankton				
RB	33.2	296.5	0.81	Full of eggs	F	SC	4				snails	Spawnbound
RB	30.3	332.0	1.19	Full of eggs	F	SC	4	zooplankton		shrimp	Snail	Spawnbound
RB	31.1	299.0	0.99	MG	F	SC	4	zooplankton		shrimp	detritus	
RB	31.2	345.0	1.14	Full of eggs	F	SC	4	zooplankton		shrimp		Spawnbound
RB	31.4	351.0	1.13	Full of eggs	F	SC	4	zooplankton		shrimp		Spawnbound
RB	26.1	179.0	1.01	IMM	F	SC	2	zooplankton		shrimp		
RB	24.3	152.0	1.06	IMM	F	SC	2	zooplankton		shrimp		
RB	27.4	232.0	1.13	MG	F	SC	2	zooplankton		clams	Snails	
RB	30.1	290.0	1.06	Full of eggs	F	SC	4	zooplankton				Spawnbound; empty
RB	33.0	365.0	1.02	Full of eggs	F	SC	4	zooplankton		shrimp		Spawnbound; ¼
RB	30.7	277.0	0.96	MG	F	SC	4	zooplankton		Clams/ shrimp	Snails	Full
RB	31.4	350.0	1.13	Full of eggs	F	SC	4	zooplankton				Spawnbound; empty

Ch. chaoborus
Cl. clams
G. gammarus
Le. leeches
P.M. phantom midge
O.M. organic matter
L. lice
T.W. tapeworms
S. snails
M. mayflies (general)
Da. daphnia
Di. diptera
Ca. callibaetis

Lake: **Dina #7**

INDIVIDUAL FISH DATA

Net Set # 1 Continued

Date Captured: September 18, 2001
Gill Net # 1 + Angling

M - Male, F - Female, ? - Not Obvious
IMM - Immature, MG - Maturing, MT - Mature, GV - Gravid, SP - Spent, ? - Not Obvious
EG - Egg, ML - Milt, HD - Head, TG - Fish Tag, ST - Stomach
SC - Scale, FR - Fin Ray, OT - Otolith, WF - Whole Fish

Method of Capture: Sinking monofilament gill net.
Condition Factor (K) = $W / L^3 \times 100$

Species	Fork Length (cm)	Weight (grams)	Condition Factor	Gonadal Maturity	Sex	Type	Age (yrs)	Stomach Contents				Comments
								Plankton	Insects	Fish	Other	
RB	31.8	369.0	1.15	Full of eggs	F	SC	4	zooplankton				Spawnbound; empty
RB	31.9	390.0	1.20	Full of eggs	F	SC	4	zooplankton		shrimp		

Ch. chaoborus
Cl. clams
G. gammarus
Le. leeches
P.M. phantom midge
O.M. organic matter
L. lice
T.W. tapeworms
S. snails
M. mayflies (general)
Da. daphnia
Di. diptera
Ca. callibaetis

Lake: **Dina #7**

INDIVIDUAL FISH DATA

Date Captured: September 19, 2001
Gill Net # 4 + Angling

M - Male
F - Female
? - Not Obvious

IMM - Immature
MG - Maturing
MT - Mature
GV - Gravid
SP - Spent
? - Not Obvious

EG - Egg
ML - Milt
HD - Head
TG - Fish Tag
ST - Stomach

SC - Scale
FR - Fin Ray
OT - Otolith
WF - Whole Fish

Method of Capture: Sinking monofilament gill net.
Condition Factor (K) = $W / L^3 \times 100$

Species	Fork Length (cm)	Weight (grams)	Condition Factor	Gonadal Maturity	Sex	Type	Age (yrs)	Stomach Contents				Comments
								Plankton	Insects	Fish	Other	
RB	25.3	153	0.94	IMM	F	SC	2	Zooplankton				angled
RB	25.8	175	1.02	IMM	F	SC	2	Zooplankton	worms			angled
RB	24.7	165	1.09	IMM	F	SC	2	Zooplankton		clams/ shrimp		angled
RB	31.2	277	0.91	Full of eggs	F	SC	4	Zooplankton				Angled / spawnbound
RB	26.9	206	1.06	IMM	F	SC	2	Zooplankton				GN: black spot disease
RB	30.8	321	1.10	Full of eggs	F	SC	4	Zooplankton				Spawnbound / empty
RB	31.1	293	0.97	Full of eggs	F	SC	4	Zooplankton				Spawnbound / empty
RB	31.0	329	1.10	Full of eggs	F	SC	4					Spawnbound / empty
RB	26.7	165	0.87	IMM	F	SC	2	Zooplankton				
RB	30.0	222	0.82	Full of eggs	F	SC	4	Zooplankton				Spawnbound
RB	22.6	127	1.10	IMM	F	SC	2	Zooplankton	worms	shrimp	Snail	
RB	30.5	265	0.93	Full of eggs	F	SC	4	Zooplankton			detritus	Spawnbound
RB	32.0	355	1.08	Full of eggs	F	SC	4					Spawnbound /empty
RB	33.1	398	1.10	Full of eggs	F	SC	4	Zooplankton			Lots of snails	Spawnbound
RB	31.3	229	0.75	Full of eggs	F	SC	4					Spawnbound /empty

Ch.	chaoborus	P.M.	phantom midge	T.W.	tapeworms	Da.	daphnia
Cl.	clams	O.M.	organic matter	S.	snails	Di.	diptera
G.	gammarus	L.	lice	M.	mayflies (general)	Ca.	callibaetis
Le.	leeches						

AGE DETERMINATION

COMPLETED BY:

North/South Consultants
83 Scurfield Blvd.
Don Macdonel and Paul Graveline
Winnipeg, Manitoba, R3T 1G4

and

Arne Langston
Peace/Williston Fish and Wildlife Compensation Program
1011, 4th Ave.
Prince George, BC V2L 3H9